GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE: October 3, 2011

TO: Chris Lanane, Guy Davis

FROM: Mike Horn

SUBJECT: Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lee Vining, October 3, 2011," for your review. Please refer any comments you may have on the document to me by December 5, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District
Quality Assurance
Audit Report

SITE:
LEE VINING

Report Date: October 3, 2011
Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the Partisol, PM-10 Monitoring Station at Lee Vining was audited on October 3, 2011. The audit was conducted by Mike Horn and was witnessed by Guy Davis, who is the site operator.

2.0 Parameters Audited:

Partisol PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District
Partisol - Plus PM - 10
FLOW AUDIT

Date of Report:	10/3/11	Site Name:	Lee Vining
Date:	10/3/11	Operator:	Guy Davis
Start:	10:35hrs. PST	Project:	SB270
Finish:	10:50hrs. PST	Site Elevation:	6781 ft
Audited By:	Mike Horn	Amb. Press.:	795.5 mm Hg
Witness:	Guy Davis	Amb. Temp.:	16.8 deg. C

Make:	R&P	Audit Temp:	Testo 735 Serial # 01467895/712
Model:	2025 Sequential	Audit Temp. Slope:	1.0006 Intercept: 0.0209
Prop. Or Ser. No.:	755/2025A210299903	Certification Date:	12/16/10
Type:	PM-10		
Last Cal. Date:	9/29/11		

Audit Device

Make:	BGI Incorporated
Model:	DELTA CAL
S/N:	0525
Range:	2 - 20 lpm
Calibration factors:	
Slope:	1.00
Int.:	0.00
Cal Date:	1/4/11

Temperature/ Pressure Verification

	Sampler	Audit Raw	Audit Calculated	Diff.
Amb Temp	17.7	16.8	16.8	0.9
Filter Temp	19.0	18.5	18.5	0.5
Amb Pressure	593.0	795.5	596.8	-3.8

Conversions:
mm Hg = hPa x 0.7502
atm = hPa/1013
in. Hg = hPa x 0.0295
° K = °C + 273

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$ w/ T in Kelvin, P in atm.

Leak Check:

		Limit
External	96 mmhg/min. Pass	<25 mmhg
Internal	23 mmhg/min. Pass	<140 mmhg

Audit Point	Audit Flow Rate Indicated	Audit Flow Rate (VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Nominal Flow Rates Upper Limit (LPM)
Total Flow Rate, Run 1	16.91	16.91	16.70	-1.2	15.0	18.4
Total Flow Rate, Run 2	16.91	16.91	16.70	-1.2	15.0	18.4
Avg Total Flow Rate	16.91	16.91	16.70	-1.2	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measurement Variable		Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direction		input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperature		input ± 0.5° C Gravimetry Lab ± 1.0 deg. C input ± 2.0° C for PM-10, PM-2.5 samplers
Relative Humidity		Ambient: input ± 5% RH, ± 1.5°C as dew point Gravimetry Lab: input ± 5%
Precipitation		input ± 10%
Barometric Pressure		Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input ± 10%; Design Flow ± 10% input ± 4%; Design Flow ± 5%
TEOM:	Total Flow Main Flow Bypass Flow	input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	1 0
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

Great Basin Unified Air Pollution Control District

Partisol

FLOW AUDIT

Date:	10/3/11		Site Name:	Lee Vining	
Start:	10:35	PST	Operator:	Guy Darvas	
Finish:	10:50	PST	Project:	SB270	
			Site Elevation:		ft
Make:	R&P		Amb. Press.:	795.5	in. Hg
Model:	2000 / 2025		Amb. Temp.:	16.8	deg. C
Prop. Or Ser. No.:	755				
Type:	PM10 / PM2.5				
Last Cal. Date:	9/29/11				

Audit Device		Temperature/ Pressure Verification			
Make:	BGI INCORPORATED		Sampler	Standard	(Raw)
Model:	DELTA CAL	Amb Temp	17.7		16.8
S/N:	~~0123~~ 525	Filter Temp	19.0		18.5
Range:	2 – 20 lpm	Amb Pressure	593 .7502 X		795.5
Calibration factors:					
Slope:	1.0				
Int.:	0.0				
Cal Date:	1/4/11				

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$ w/ T in Kelvin, P in atm. ÷ 1013

Leak Check:	Initial Pres.	Final Pres.	$P_i - P_f$	Limit
External				<5 psi / <25mm
Internal	96 23	PASS PASS		

Audit Point	Audit Flow Rate Indicated	(VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Upper Limit (LPM)
1. Total Fow Rate	16.91		16.70		15.0	18.4
2.	16.91		16.70			
AVE Total Flow Rate	16.91		16.70		15.0	18.4

Comments:

Calibrated by: Mike Thomas

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE: August 2, 2011

TO: Chris Lanane, Guy Davis

FROM: Mike Horn

SUBJECT: Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lee Vining, August 1, 2011," for your review. Please refer any comments you may have on the document to me by October 3, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District
Quality Assurance
Audit Report

SITE:
LEE VINING

Report Date: August 2, 2011
Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the Partisol, PM-10 Monitoring Station at Lee Vining was audited on August 1, 2011. The audit was conducted by Mike Horn and was witnessed by Guy Davis, who is the site operator.

2.0 Parameters Audited:

Partisol PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District
Partisol - Plus PM - 10
FLOW AUDIT

Date of Report: 8/2/11
Date: 8/1/11
Start: 13:20hrs. PST
Finish: 13:40hrs. PST
Audited By: Mike Horn
Witness: Guy Davis

Site Name: Lee Vining
Operator: Guy Davis
Project: SB270
Site Elevation: 6781 ft
Amb. Press.: 801.5 mm Hg
Amb. Temp.: 26.8 deg. C

Make: R&P
Model: 2025 Sequential
Prop. Or Ser. No.: 755/2025A210299903
Type: PM-10
Last Cal. Date: 7/27/11

Audit Temp: Testo 735 Serial # 01467895/712
Audit Temp. Slope: 1.0006 Intercept: 0.0209
Certification Date: 12/16/10

Temperature/ Pressure Verification

		Audit		
	Sampler	Raw	Calculated	Diff.
Amb Temp	27.9	26.8	26.8	1.1
Filter Temp	28.3	27.9	27.9	0.4
Amb Pressure	598.0	801.5	601.3	-3.3

Audit Device
Make: BGI Incorporated
Model: DELTA CAL
S/N: 0525
Range: 2 - 20 lpm
Calibration factors:
Slope: 1.00
Int.: 0.00
Cal Date: 1/4/11

Conversions:
mm Hg = hPa x 0.7502
atm = hPa/1013
in. Hg = hPa x 0.0295
° K = °C + 273

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$

w/ T in Kelvin, P in atm.

Leak Check:

		Limit
External	23 mmhg/min. Pass	<25 mmhg
Internal	76 mmhg/min. Pass	<140 mmhg

Audit Point	Audit Flow Rate Indicated	Audit Flow Rate (VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Nominal Flow Rates Upper Limit (LPM)
Total Flow Rate, Run 1	17.16	17.16	16.70	-2.7	15.0	18.4
Total Flow Rate, Run 2	17.16	17.16	16.70	-2.7	15.0	18.4
Avg Total Flow Rate	17.16	17.16	16.70	-2.7	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measurement Variable		Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direction		input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperature		input ± 0.5° C Gravimetry Lab ± 1.0 deg. C input ± 2.0° C for PM-10, PM-2.5 samplers
Relative Humidity		Ambient: input ± 5% RH, ± 1.5°C as dew point Gravimetry Lab: input ± 5%
Precipitation		input ± 10%
Barometric Pressure		Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input ± 10%; Design Flow ± 10% input ± 4%; Design Flow ± 5%
TEOM:	Total Flow Main Flow Bypass Flow	input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	1 0
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

Great Basin Unified Air Pollution Control District

Partisol

FLOW AUDIT

Date:	8/1/11		Site Name:	Lee Vining / Bus Depot	
Start:	13:26	PST	Operator:		
Finish:	13:40	PST	Project:	SB270	
			Site Elevation:		ft
Make:	R&P		Amb. Press.:	801.5	in. Hg
Model:	2000 / 2025		Amb. Temp.:	26.8	deg. C
Prop. Or Ser. No.:	755				
Type:	PM10 / PM2.5				
Last Cal. Date:	7/27/11				

Audit Device		Temperature/ Pressure Verification			
Make:	BGI INCORPORATED		Sampler	Standard	(Raw)
Model:	DELTA CAL	Amb Temp	27.9		26.8
S/N:	~~0123~~ 525	Filter Temp	28.3		27.9
Range:	2 – 20 lpm	Amb Pressure	598		801.5
Calibration factors:			.7502X		
Slope:	1.0				
Int.:	0.0				
Cal Date:	1/4/11				

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$ w/ T in Kelvin, P in atm. ÷ 1013

Leak Check:	Initial Pres.	Final Pres.	$P_i - P_f$	Limit
External	23		PASS	<5 psi / <25mm
Internal	26		PASS	

Audit Point	Audit Flow Rate Indicated	(VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Upper Limit (LPM)
1. Total Fow Rate	17.16		16.70		15.0	18.4
2.	17.16		16.70			
AVE Total Flow Rate	17.16		16.70		15.0	18.4

Comments:

Calibrated by: Mike Tu

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE: May 6, 2011

TO: Chris Lanane, Guy Davis

FROM: Mike Horn

SUBJECT: Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lee Vining, May 6, 2011," for your review. Please refer any comments you may have on the document to me by July 6, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District
Quality Assurance
Audit Report

SITE:
LEE VINING

Report Date: May 6, 2011
Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the Partisol, PM-10 Monitoring Station at Lee Vining was audited on May 3, 2011. The audit was conducted by Mike Horn and was witnessed by Guy Davis, who is the site operator.

2.0 Parameters Audited:

Partisol PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District
Partisol - Plus PM - 10
FLOW AUDIT

Date of Report: 5/6/11
Date: 5/3/11
Start: 14:10hrs. PST
Finish: 14:25hrs. PST
Audited By: Mike Horn
Witness: Guy Davis

Site Name: Lee Vining
Operator: Guy Davis
Project: SB270
Site Elevation: 6781 ft
Amb. Press.: 798.5 mm Hg
Amb. Temp.: 18.5 deg. C

Make: R&P
Model: 2025 Sequential
Prop. Or Ser. No.: 755/2025A210299903
Type: PM-10
Last Cal. Date: 1/28/11

Audit Temp: Testo 735 Serial # 01467895/712
Audit Temp. Slope: 1.0006 Intercept: 0.0209
Certification Date: 12/16/10

Audit Device
Make: BGI Incorporated
Model: DELTA CAL
S/N: 0525
Range: 2 - 20 lpm
Calibration factors:
Slope: 1.00
Int.: 0.00
Cal Date: 1/4/11

Temperature/ Pressure Verification

	Sampler	Audit Raw	Audit Calculated	Diff.
Amb Temp	18.5	18.5	18.5	0.0
Filter Temp	20.2	20.1	20.1	0.1
Amb Pressure	596.0	798.5	599.0	-3.0

Conversions:
mm Hg = hPa x 0.7502
atm = hPa/1013
in. Hg = hPa x 0.0295
° K = °C + 273

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$

w/ T in Kelvin, P in atm.

Leak Check:

		Limit
External 23 mmhg/min.	Pass	<25 mmhg
Internal 60 mmhg/min.	Pass	<140 mmhg

Audit Point	Audit Flow Rate Indicated	Audit Flow Rate (VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Nominal Flow Rates Upper Limit (LPM)
Total Flow Rate, Run 1	17.14	17.14	16.70	-2.6	15.0	18.4
Total Flow Rate, Run 2	17.14	17.14	16.70	-2.6	15.0	18.4
Avg Total Flow Rate	17.14	17.14	16.70	-2.6	15.0	18.4

Comments: None.

TABLE A-1

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measurement Variable		Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direction		input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperature		input ± 0.5° C input ± 2.0° C for PM-10, PM-2.5 samplers
Relative Humidity		Ambient: input ± 5% RH, ± 1.5°C as dew point Gravimetry Lab: input ± 5%
Precipitation		input ± 10%
Barometric Pressure		Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input ± 10%; Design Flow ± 10% input ± 4%; Design Flow ± 5%
TEOM:	Total Flow Main Flow Bypass Flow	input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10% input ± 10%; Design Flow ± 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

Great Basin Unified Air Pollution Control District

Partisol

FLOW AUDIT

Date:	5/3/11	Site Name:	Lee Vining
Start:	14:10 PST	Operator:	Dan Dafoe
Finish:	14:25 PST	Project:	SB270
		Site Elevation:	ft
Make:	R&P	Amb. Press.:	798.5 in. Hg
Model:	2000 / 2025	Amb. Temp.:	18.5 deg. C
Prop. Or Ser. No.:	7557		
Type:	PM10 / PM2.5		
Last Cal. Date:			

Audit Device		Temperature/ Pressure Verification			
Make:	BGI INCORPORATED		Sampler	Standard	(Raw)
Model:	DELTA CAL	Amb Temp	18.5		18.5
S/N:	~~0123~~ 5235	Filter Temp	20.2		20.1
Range:	2 - 20 lpm	Amb Pressure	596		798.5
Calibration factors:			.7502 X		
Slope:	1.0				
Int.:	0.0				
Cal Date:	1/4/11				

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$ w/ T in Kelvin, P in atm. ÷ 1013

Leak Check:	Initial Pres.	Final Pres.	$P_i - P_f$	Limit
External	23	PASS		<5 psi / <25mm
Internal	60	PASS		

Audit Point	Audit Flow Rate Indicated (VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Upper Limit (LPM)
1. Total Fow Rate	17.14	16.70		15.0	18.4
2.	17.14	16.70			
AVE Total Flow Rate	17.14	16.70		15.0	18.4

Comments:

Calibrated by: MH

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

MEMORANDUM

DATE: October 4, 2011

TO: Chris Lanane, Guy Davis

FROM: Mike Horn

SUBJECT: Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lee Vining, February 4, 2011," for your review. Please refer any comments you may have on the document to me by April 4, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

Great Basin Unified Air Pollution Control District
Quality Assurance
Audit Report

SITE:
LEE VINING

Report Date: February 4, 2011
Prepared by: Mike S. Horn

1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the Partisol, PM-10 Monitoring Station at Lee Vining was audited on February 2, 2011. The audit was conducted by Mike Horn and was witnessed by Guy Davis, who is the site operator.

2.0 Parameters Audited:

Partisol PM-10

3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

Great Basin Unified Air Pollution Control District
Partisol - Plus PM - 10
FLOW AUDIT

Date of Report: 2/4/11
Date: 2/1/11
Start: 14:00hrs. PST
Finish: 14:20hrs. PST
Audited By: Mike Horn
Witness: Guy Davis

Site Name: Lee Vining
Operator: Guy Davis
Project: SB270
Site Elevation: 6781 ft
Amb. Press.: 802.4 mm Hg
Amb. Temp.: -1.7 deg. C

Make: R&P
Model: 2025 Sequential
Prop. Or Ser. No.: 755/2025A210299903
Type: PM-10
Last Cal. Date: 1/28/11

Audit Temp: Testo 735 Serial # 01467895/712
Audit Temp. Slope: 1.0006 Intercept: 0.0209
Certification Date: 12/16/10

Audit Device
Make: BGI Incorporated
Model: DELTA CAL
S/N: 0525
Range: 2 - 20 lpm
Calibration factors:
Slope: 1.00
Int.: 0.00
Cal Date: 1/4/11

Temperature/ Pressure Verification

	Sampler	Audit Raw	Audit Calculated	Diff.
Amb Temp	-1.4	-1.7	-1.7	0.3
Filter Temp	1.4	1.2	1.2	0.2
Amb Pressure	600.0	802.4	602.0	-2.0

Conversions:
mm Hg = hPa x 0.7502
atm = hPa/1013
in. Hg = hPa x 0.0295
° K = °C + 273

$Q_a=m[dPxT_a/P_a]^{1/2}+b$

w/ T in Kelvin, P in atm.

Leak Check:

		Limit
External 21 mmhg/min.	Pass	<25 mmhg
Internal 72 mmhg/min.	Pass	<140 mmhg

Audit Point	Audit Flow Rate Indicated	Audit Flow Rate (VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Nominal Flow Rates Upper Limit (LPM)
Total Flow Rate, Run 1	16.94	16.94	16.70	-1.4	15.0	18.4
Total Flow Rate, Run 2	16.94	16.94	16.70	-1.4	15.0	18.4
Avg Total Flow Rate	16.94	16.94	16.70	-1.4	15.0	18.4

Comments: None.

Appendix B

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

AUDIT DEVICE	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

Great Basin Unified Air Pollution Control District

Partisol

FLOW AUDIT

Date:	2/2/11		Site Name:	Lee Vining	
Start:	14:06	PST	Operator:	Lucy Darby	
Finish:	14:20	PST	Project:	SB270	
			Site Elevation:		ft
Make:	R&P		Amb. Press.:	802.4	in. Hg
Model:	2000 / 2025		Amb. Temp.:	-1.7	deg. C
Prop. Or Ser. No.:	755 /				
Type:	PM10 / PM2.5				
Last Cal. Date:					

Audit Device		Temperature/ Pressure Verification			
Make:	BGI INCORPORATED		Sampler	Standard	(Raw)
Model:	DELTA CAL	Amb Temp	-1.4		-1.7
S/N:	~~0123~~ 525	Filter Temp	-1.4		-1.2
Range:	2 - 20 lpm	Amb Pressure	6.00		802.4
Calibration factors:			.7502X		
Slope:	1.0				
Int.:	0.0				
Cal Date:	1/4/11				

$Q_a = m[dP \times T_a / P_a]^{1/2} + b$ w/ T in Kelvin, P in atm. ÷ 1013

Leak Check:	Initial Pres.	Final Pres.	$P_i - P_f$	Limit
External	21		PASS	<5 psi / <25mm
Internal	12		PASS	

Audit Point	Audit Flow Rate Indicated	(VLPM)	Site Flow Rate (VLPM)	Diff. (%)	Nominal Flow Rates Lower Limit (LPM)	Upper Limit (LPM)
1. Total Fow Rate	16.94		16.78		15.0	18.4
2.	16.94		16.78			
AVE Total Flow Rate	16.94		16.70		15.0	18.4

Comments:

Calibrated by: [signature]